What is claimed is:

1. A rotary encoder comprising: a fixed section; a rotating section which can be rotated with reference to the fixed section; angle detecting means for detecting a rotation angle of the rotating section with reference to a predetermined reference position of the rotating section; and output means for outputting the detected angle, wherein, when the angle detecting means detects an angle $\theta n = n \times \theta s$ ($n = 1, 2, \ldots, N$ (where $N \times \theta s = 360°$)) which is an integer multiple of a predetermined angle θs ($\theta s \geq$ output resolution) such that the rotating section is rotated, an angle error $E(\theta n)$ included in the detected angle θn is measured, functions between the detected angles θn and errors $E(\theta n)$ are defined by the following equation with respect to all n:

$$E(\theta n) = \sum_{i=1}^{N/2} A_i \cdot \sin(i\theta n + \phi_i)$$

an amplitude A_i and an initial phase φ_i ($i = 1, 2, \ldots, N/2$ or $(N-1)/2$) are calculated such that all the defined equations are satisfied, storing means for storing an error function which is given by the following equation:

$$E(\theta) = \sum_{i=1}^{N/2} A_i \cdot \sin(i\theta + \phi_i)$$

and which is a periodic function of a detected angle θa having

the calculated amplitude A_i and the calculated initial phase φ_i as coefficients is arranged, the detected angle θa detected by the angle detection means is substituted for the variables θ in the equation of the error function E(θ) stored by the storing means, and a value obtained by subtracting the value E(θa) obtained by the substitution from the detected angle θa is outputted by the output means.

2. A rotary encoder comprising: a fixed section; a rotating section which can be rotated with reference to the fixed section; angle detecting means for detecting a rotation angle of the rotating section with reference to a predetermined reference position of the rotating section; and output means for outputting the detected angle, wherein, when the angle detecting means detects an angle θn = n x θs (n = 1, 2, ... , N (where N x θs = 360°)) which is an integer multiple of a predetermined angle θs (θs ≥ output resolution) such that the rotating section is rotated, an angle error E (θn) included in the detected angle θn is measured, combinations between the detected angles θn and errors E(θn) are defined by the following equation with respect to all n:

$$E(\theta n) = \sum_{i=1}^{N/2} A_i \cdot \sin(i\theta n + \phi_i)$$

an amplitude A_i and an initial phase φ_i (i = 1, 2, ... , N/2 or (N-1)/2) are calculated such that all the defined equations are

satisfied, storing means for storing an error function which is given by the following equation:

$$E(\theta) = \sum_{i=1}^{m} A_{ki} \cdot \sin(k_i \theta + \phi_{ki})$$

and which is a periodic function of the detected angle θa having at least one amplitude A_{k1}, A_{k2}, ... , A_{km} and at least one initial phase φ_{k1}, φ_{k2}, ... , φ_{km} (k1, k2, ... , km is at least one of natural numbers from 1 to N/2 or (N - 1)/2) of the calculated amplitudes A_i and the calculated initial phases φ_i as coefficients is arranged, the detected angle θa detected by the angle detection means is substituted for the variables θ in the equation of the error function $E(\theta)$ stored by the storing means, and a value obtained by subtracting the value $E(\theta a)$ obtained by the substitution from the detected angle θa is outputted by the output means.